

AMENDMENTS

Amendments to Claims:

Please amend the claims without prejudice. The listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

1. (Currently Amended) A drilling apparatus comprising:
a turbine ~~(2)~~ being provided with a turbine shaft ~~(4)~~,
a hydraulic braking device configured to operate with the turbine,
wherein the hydraulic braking device comprising a braking shaft coupled to the turbine shaft and ~~consists of~~ one or more bodies ~~(12)~~ rotatably connected to the braking turbine shaft ~~(4)~~,
and

wherein when the hydraulic braking device ~~(10)~~ is immersed in a drilling fluid medium,
an axial rotation of the turbine shaft ~~(4)~~ about its axis ~~(6)~~ causes an axial rotation of the braking shaft which in turn causes a movement of the one or more bodies ~~(12)~~ with respect to the drilling fluid medium, this movement generating a resisting torque ~~(T)~~ that is a function of the square of the rotation speed ~~(ω)~~ of the turbine shaft ~~(4)~~ with respect to the drilling fluid medium providing a quadratic relation, and

wherein the construction of the hydraulic braking device is such that a braking effect is obtained when the rotation speed of the turbine shaft exceeds a predetermined threshold value and the braking effect is not obtained when under the predetermined value as a result of the quadratic relation.

2. (Canceled).

3. (Canceled).

4. (Currently Amended) The drilling apparatus device ~~(10)~~ according to claim 2 1, wherein the braking shaft ~~(14)~~ is coaxial with the turbine shaft ~~(4)~~.
5. (Currently Amended) The drilling apparatus device ~~(10)~~ according to claim 2 1, wherein the braking shaft ~~(14)~~ and the turbine shaft ~~(4)~~ are combined into a single shaft.
6. (Canceled).
7. (Canceled).
8. (Canceled).
9. (Canceled).
10. (Currently Amended) The drilling apparatus device ~~(10)~~ according to claim 2 1, wherein the one or more bodies ~~(12)~~ is are rigidly connected to the braking shaft ~~(14)~~ through a connecting means ~~(18, 20)~~.
11. (Currently Amended) The drilling apparatus device ~~(10)~~ according to claim 2 1, wherein the one or more bodies ~~(12)~~ is are fixed directly onto the braking shaft ~~(14)~~ through a connecting means composed of at least one anchor zone ~~(18)~~ of the bodies ~~(12)~~.
12. (Canceled).
13. (Canceled).
14. (Currently Amended) The drilling apparatus device ~~(10)~~ according to claim 2 1, wherein when the hydraulic braking device comprises more than one body ~~(12)~~, the bodies ~~(12)~~ are distributed around the periphery of the braking shaft ~~(14)~~, in a regular manner, or in a non-regular manner.

15. (Currently Amended) The drilling apparatus device ~~(10)~~ according to claim 2 1, wherein when the hydraulic braking device comprises more than one body ~~(12)~~, the bodies ~~(12)~~ have either all the same axial positions along the braking shaft ~~(14)~~, or different axial positions along the braking shaft ~~(14)~~.

16. (Currently Amended) The drilling apparatus device ~~(10)~~ according to claim 1, wherein when the hydraulic braking device comprises more than one body ~~(12)~~, the bodies ~~(12)~~ are chosen to be identical or different

17. (Currently Amended) The drilling apparatus device ~~(10)~~ according to claim 1, wherein when the hydraulic braking device comprises more than one body ~~(12)~~, the bodies ~~(12)~~ all have the same dimensions.

18. (Canceled).

19. (Currently Amended) The drilling apparatus device ~~(10)~~ according to claim 1, wherein the hydraulic braking device is arranged on the downstream side of the turbine ~~(2)~~ with respect to a flow direction of the drilling fluid medium.

20. (Canceled).

21. (Canceled).

22. (Canceled).

23. (Currently Amended) A turbine ~~(2)~~ comprising:
a turbine shaft ~~(4)~~; and;
a hydraulic braking device ~~(10)~~ comprising a braking shaft coupled to the turbine shaft
and consisting one or more bodies ~~(12)~~ rotatably connected to the turbine shaft ~~(4)~~;

wherein when the hydraulic braking device (10) is immersed in a drilling fluid medium, an axial rotation of the turbine shaft (4) ~~about its axis (6)~~ causes an axial rotation of the braking shaft which in turn causes a movement of the one or more bodies (12) with respect to the drilling fluid medium, this movement generating a resisting torque (T) that is a function of the square of the rotation speed (ω) of the turbine shaft (4) with respect to the drilling fluid medium providing a quadratic relation; and

wherein the construction of the hydraulic braking device is such that a braking effect is obtained when the rotation speed of the turbine shaft exceeds a predetermined threshold value and the braking effect is not obtained when under the predetermined value as a result of the quadratic relation.

24. (Currently Amended) The drilling apparatus device according to claim 1, wherein the one or more bodies ~~extent in~~ extend along a length of the ~~turbine~~ braking shaft.

25. (Currently Amended) The drilling apparatus device according to claim 1, wherein the one or more bodies ~~extent~~ extend in a substantially normal direction from the ~~turbine~~ braking shaft.

26. (Currently Amended) The drilling apparatus device according to claim 1, wherein a flow of the drilling fluid medium drives the turbine.

27. (Currently Amended) The drilling apparatus device according to claim 1, wherein the flow is parallel to a central axis of the ~~turbine~~ braking shaft and to a length of the one or more bodies.

28. (New) The drilling apparatus according to claim 1, wherein the turbine shaft and the braking shaft are coupled by a coupling device so that the rotation speed of the braking shaft is proportional to but different from the rotation speed of the turbine shaft.

29. (New) The drilling apparatus according to claim 1, wherein the one or more bodies comprise at least one cup-shaped or V-shaped body that is arranged such that the concave side of the at least one cup-shaped or V-shaped body is oriented to face a flow direction of the drilling fluid.